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| 10/718,412 | 11/19/2003 | Julius Robson | 920476-95123 | 9671 |
| 23644 7590 01/03/2008 BARNES & THORNBURG LLP P.O. BOX 2786 CHICAGO, IL 60690-2786 | | | EXAMINER CHO, UN C | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent-ch@btlaw.com

Office Action Summary

Application No.

10/718,412

Applicant(s)

ROBSON ET AL.

Examiner

Un C. Cho

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-40 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 2 is objected to because of the following informalities:

Claim 2, line 1 recites "wherein the a number of resource ..." it should be "wherein the number of resource ..." instead.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 12 – 15, 24, 37 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by the Admitted Prior Art (hereinafter "APA").

Regarding claim 1, the APA discloses establishing a number of resource units making up a fixed allocation of resource units which is the same for all user equipments of the network (APA: Page 1, line 30 through Page 2, line 6); allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 2, lines 7 – 10).

Regarding claims 12, 13, 14, 15, 24, 37 and 38, the claims are interpreted and rejected for the same reason as set forth in claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 – 4, 7, 16 – 18, 20, 25, 26, 29, 33 – 35 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Wu et al. (US 2004/0125772 A9).

Regarding claim 2, the APA as applied above does not specifically disclose determining a measure of a maximum likely number of child user equipments per partition of the network; calculating the fixed allocation of resource units based on the ratio of a number of resource units in the partition per unit time to the measure. In an analogous art, Wu remedies the deficiencies of the APA by disclosing such limitation on Page 5, Paragraph 0090, line 1 through Paragraph 0102, line 6 wherein a number of active users is determined within a partition and performs optimization based on the maximization of proportional factors such as transmission rate and average throughput. Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to provide the technique of Wu to the system of the APA in order to provide an optimization technique to limit the interference and increase Signal-to-Noise Ratio.

Regarding claim 3, Wu as applied above discloses wherein the fixed allocation is a selected minimum number of resource units (each sector operating in two sub-bands; Wu: Page 4, Paragraph 0080, line 1 through Paragraph 0081, line 10).

Regarding claim 4, Wu as applied above discloses wherein the spectral resource is made up of a number of frequency channels and each resource unit is a subset of the spectral resource smaller than a frequency channel (an available bandwidth is divided into three sub-bands wherein each sector is only allowed to use two of the sub-bands; Wu: Page 4, Paragraph 0080, line 1 through Paragraph 0081, line 10).

Regarding claim 7, Wu as applied above discloses wherein resource units which are not allocated in the fixed allocation of resource units to child user equipments remain unallocated to user equipments (Wu discloses that in performing optimization it takes into account two active users, however, there are more than two users per partition which might not be active, thus it would have been obvious to one of ordinary skill in the art to know that inactive users will not be allocated with any resources; Wu: Page 5, line 1 through Paragraph 0094, line 7).

Regarding claims 16, 25, 33, 34 and 35, the claims are interpreted and rejected for the same reason as set forth in claim 2.

Regarding claims 17 and 28, the claims are interpreted and rejected for the same reason as set forth in claim 3.

Regarding claims 18 and 26, the claims are interpreted and rejected for the same reason as set forth in claim 4.

Regarding claims 20 and 29, the claims are interpreted and rejected for the same reason as set forth in claim 7.

Regarding claim 39, the APA in view of Wu as applied above discloses determining a measure of a maximum likely number of child user equipments per partition of the network; calculating a fixed allocation of resource units based on the ratio of a number of resource units in the partition per unit time to the measure (Wu: Page 5, Paragraph 0090, line 1 through Paragraph 0102, line 6 wherein a number of active users is determined within a partition and performs optimization based on the maximization of proportional factors such as transmission rate and average throughput); and allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 2, lines 7 – 10).

6. Claims 5, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Wu as applied to claim 2 above, and further in view of Hwang et al. (US 2004/0097238 A1).

Regarding claim 5, the APA in view of Wu as applied above does not specifically disclose wherein the measure of the maximum likely number of user equipments per partition is derived according to a Poisson distribution of the average number of user equipments per partition of the network. In an analogous art, Hwang remedies the deficiencies of the APA in view of Wu by disclosing such limitation on Page 3, Paragraph 0054, lines 1 – 3 wherein numbers of users are derived according to a Poisson distribution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the modified system of the APA in view of Wu in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Regarding claims 19 and 27, the claims are interpreted and rejected for the same reason as set forth in claim 5.

7. Claims 8, 9, 21, 22, 30, 31 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Hwang et al.

Regarding claim 8, the APA as applied above does not specifically disclose determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by prioritizing user equipments having a high gain link. In an analogous art, Hwang disclosing such limitation on Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6 wherein resources are allocated to the MS having the lowest SIR. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the system of the APA in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Regarding claim 9, Hwang as applied above discloses determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments in the partition in proportion to the gain of the radio links to the child user equipments (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6).

Regarding claims 21 and 30, the claims are interpreted and rejected for the same reason as set forth in claim 8.

Regarding claims 22 and 31, the claims are interpreted and rejected for the same reason as set forth in claim 9.

Regarding claim 40, the APA in view of Hwang discloses establishing a minimum number of resource units making up a fixed allocation of resource units

which is to be allocated to all user equipments of the network; allocating the fixed allocation of resource units to each child user equipment in the partition (APA: Page 1, line 30 through Page 2, line 10); and allocating remaining resource units which are not allocated in the fixed allocation of resource units to child user equipments by determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by prioritizing user equipments having a high gain link (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6).

8. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA in view of Hwang and further in view of Jin et al. (US 2004/0147235 A1).

Regarding claim 10, the APA in view of Hwang discloses determining the gain of the radio link between the partition and each child user equipment of the partition (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6).

However, the APA in view of Hwang as applied above does not specifically disclose and regulating the transmit power of each child user equipment according to the determined gain for that user equipment such that lower gain user equipments transmit with high power than higher gain user equipments. In an analogous art, Jin remedies the deficiencies of the APA in view of Hwang by disclosing such limitation on Page 2, Paragraph 0018, lines 1 – 8 wherein the mobile terminal regulates its transmit power depending on the gain

stages. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Jin to the modified system of the APA in view of Hwang in order to provide an efficient method and apparatus that compensates for signal dependent gain variations.

Regarding claim 11, the APA in view of Hwang and further in view of Jin as applied above discloses determining the gain of the radio link between the partition and each child user equipment of the partition (Hwang: Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6); and regulating the transmit power of each child user equipment such that the transmit power is inversely proportional to the gain (transmit power dependent on gain variations; Jin: Page 2, Paragraph 0018, lines 1 – 8).

Regarding claims 23 and 32, the claims are interpreted and rejected for the same reason as set forth in claim 10.

9. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Hwang.

Regarding claim 36, Wu discloses discarding resource units allocated to child users equipments in a fixed allocation so as to determine remaining resource units (*idem*).

However, Wu as applied above does not specifically disclose determining the gain of the radio link between the partition and each child user equipment; and allocating the remaining resource units among the child user equipments by

prioritizing user equipments having a high gain link. In an analogous art, Hwang remedies the deficiencies of Wu by disclosing such limitation on Page 4, Paragraph 0068, line 1 through Paragraph 0096, line 6 wherein resources are allocated to the MS having the lowest SIR. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Hwang to the system of the APA in order to provide an effective method of increasing frequency reuse in an OFDM mobile communication system according to a determined number of users.

Allowable Subject Matter

10. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the APA in view of Wu, in view of Hwang and in view of Jin either alone or in combination fails to teach the equation as stated in claim 6.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Un C. Cho whose telephone number is (571) 272-7919. The examiner can normally be reached on M ~ F 8:00AM to 4:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Un C Cho
Examiner
Art Unit 2617

12/21/07 *UC*


GEORGE ENG
SUPERVISORY PATENT EXAMINER